INDUMART Canada
www.indumart.com

Dual Loop Universal Input Controller

SERIES: DCL400

- 2 INDEPENDENT CONTROL LOOPS
- 2 UNIVERSAL ANALOGUE INPUTS & 2 LOGIC INPUTS
- 1 ADDITIONAL ANALOGUE INPUT (OPTION)
- 2 ALGORITHMS FOR PID PARAMETERS (AUTO TUNING)
- THREE-STAGE MOTORIZED VALVE CONTROL (DCL400V)
- 15 SET POINT PROGRAMS OF 15 SEGMENTS (DCL400P)
- TWO-STATE, THREE-STATE OR STEP-BY-STEP ACTION
- EASY CONFIGURATION AND PROGRAMMING
- MODBUS COMMUNICATION RS-485 (OPTION)
- 10 ANNUNCIATORS FOR OUTPUT AND WORKING MODE
- 2 x 16 CHARACTER DISPLAY TO COMMUNICATE WITH USER
- UP TO 4 RELAY OR TRANSISTOR OR 2 ANALOGUE OUTPUTS
- RETRANSMISSION OF INPUT SIGNALS OR THE SETPOINT
- PID & ON/OFF CONTROL, HEATING, COOLING, HEAT+COOL
- ADDITION, SUBTRACTION OR MULTIPLICATION OF THE 2 INPUTS

CE

¼ DIN (96 x 96 mm)

INTRODUCTION

Indumart *DCL400 Series* Dual Loop Universal Input Controllers accept current, voltage, resistance, thermocouple and RTD signals, and can independently control two systems, or two physical quantities in one system. The controller also has two logic inputs and may have an additional current, voltage or resistance input to be used as remote setpoint. It also performs arithmetic functions of addition, subtraction and multiplication of the two inputs.

The standard version of *DCL400 Series* has fifteen user configurable programs available with 15 segments in each program. By assigning a program, the set point will be a function of time, in accordance to the desirable setting, and the logic input can serve to control the set point program. The special version of these controllers (DCL400V) is design to control motorized valves with two algorithms of stepper control, with or without feedback, and does not carry the programming feature.

These controllers display measured values, set point, the output signal and other process parameters on their two 5-digit, and two 16-segment LCD displays. The set point can be constant, changeable during the process or read out from the additional input.

The PID auto-tuning with two algorithms ensures optimal control quality, while four sets of PID parameters and four set points can be stated and selected by the user.

The *DCL400 Series* controllers have four outputs, which can be used as 1) alarm relays, 2) a two-state action, 3) three-state action of heating-cooling type, 4) three-state step-by-step action or continuous outputs (control or retransmission).

The MODBUS protocol RS-485 interface may be ordered as option.

Input Signal and Measuring Ranges

Input	Signal	Accuracy	Measuring Range
No. 1 and No.2 Inputs	Pt100	0.1	-200...850°C
	Pt500	0.1	-200...850°C
	Pt1000	0.1	-200...850°C
	Ni100	0.2	-60...180°C
	Cu100	0.2	-50...180°C
	T/C-J	0.2	-200...1200°C
	T/C-T	0.2	-100...400°C
	T/C-K	0.1	-200...1370°C
	T/C-S	0.2	-50...1760°C
	T/C-R	0.2	-50...1760°C
	T/C-B	0.3[1)]	300...1820°C
	T/C-E	0.1	-200...1000°C
	T/C-N	0.1	-150...1300°C
	0...20 mA	0.05	0...20 mA
	4...20 mA	0.05	4...20 mA
	0...10 V[2)]	0.05	0...10 V
	0...5 V[2)]	0.05	0...5 V
	1...5 V[2)]	0.05	1...5 V
	0...1 V[3)]	0.05	0...1 V
Optional Analogue Input	0...20 mA	0.05	0...20 mA
	4...20 mA	0.05	4...20 mA
	0...10 V	0.05	0...10 V
	0...5 V	0.05	0...5 V
	1...5 V	0.05	1...5 V
	0...1 V	0.05	0...1 V
	0...100Ω	0.05	0...100Ω
	0...1000Ω	0.05	0...1000Ω

1) for 500...1820°C 2) source resistance < 10kΩ 3) source resistance < 1kΩ

SPECIFICATIONS

Analogue Input	2 (1 for each loop) + 1 optional
Output	*Continuous*
	4...20 or 0...20 mA, $R_{load} \leq 500\Omega$
	0...10 V or 0...5 V, $R_{load} \geq 500\Omega$
	Electromagnetic Relays
	5A @ 220 VAC
	OC type Transistors
	24 V max., 10 mA max.
	Logic
	0/15 V, 20 mA maximum
Analogue Output Error	0.2% of range (0.3% for 0...5 V)
Output Action	Direct action (for cooling); Reverse action (for heating); 2 circuits heating + cooling 3-stage valve control (DCL400V)
Control Algorithm	PID (2 auto-tuning algorithms) ON/OFF with hysteresis
Logic Input	2 no-power short or open circuit
Sampling Period	0.17 sec for each analogue input 0.33 sec for each 3-wire RTD inputs
Display	2 x 5-digit LEDs (measured & set values) 4 LEDs for output states; 6 LEDs for controller state; 2 x 16-character LCD display
Kind of Set Point	Fixed, by additional input, soft start ramp & soak programmed
Ramp/soak program	15 programs with 1 to 15 intervals in each program
Number of Cycles	1...99
Serial Interface	MODBUS protocol RS-485
Baud Rate	19200, 9600, 4800, 2400 bit/s
Working Mode	ASCII: 8N1, 7E1, 7O1 RTU: 8N2, 8E1, 8O1, 8N1
Power Supply	20...40 VDC/VAC 85...253 VDC/VAC
Supply Voltage Freq.	40...440 Hz
Power Consumption	< 9 VA
RTD Lead Resistance	Less than 10 Ω per lead
Lead Resis. Change Er.	<0.1% of input
Cold Junction Error	<2°C
Ambient Temp. Error	<0.1% of input range per 10°C
Ambient Temperature	0...50˚C
Humidity	10...90% RH
Protection	IP40 on front panel
Electrical Safety	EN61010-1, Category III; Level 2
EMC Emission	EN 61000-6-4
EMC Immunity	EN 61000-6-2
Weight	400 g (0.9 lb)

ORDER CODE

Model **DCL400** – [ ][ ][ ][ ][ ][ ]

VERSION
- P — Programmable (standard)
- V — Valve Control

ADDITIONAL INPUT
- 0 — Without
- 1 — Current Linear 0/4...20 mA
- 2 — Voltage Linear 0...5/10 V or Potentiometric Transmitter 0...100 Ω or Potentiometric Transmitter 0...1000 Ω

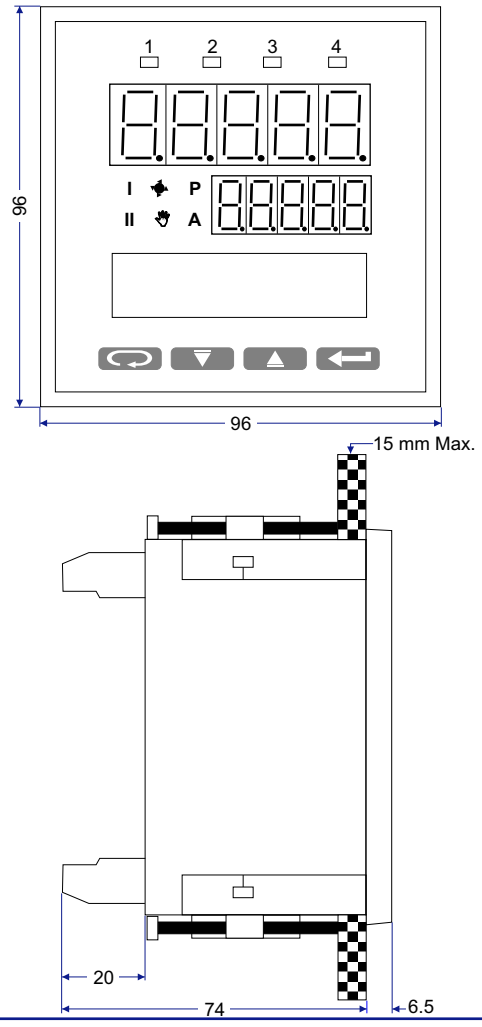
OUTPUTS
- 1 — 4 Relays
- 2 — 4 OC Transistors
- 3 — 1 Logic 0/15 V + 3 Relays
- 4 — 2 Logic 0/15 V + 2 Relays
- 5 — 1 Continuous Output + 3 Relays
- 6 — 1 Continuous Output + 3 OC Transistors
- 7 — 2 Continuous Outputs + 2 Relays
- 8 — 2 Continuous Outputs + 2 OC Transistors
- X — No Output

COMMUNICATION
- 0 — Without
- 1 — RS-485 Interface with MODBUS Protocol

SUPPLY VOLTAGE
- 1 — 85...253 VAC or VDC
- 2 — 20...40 VDC or VAC

TYPE OF EXECUTION
- 8 — Standard
- X — According to Customer Requirements

DIMENSIONS (mm)



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